



Electron transport properties of some new 4-tert-butylcalix[4]arene derivatives in thin films

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Titre Electron transport properties of some new 4-tert-butylcalix[4]arene derivatives in thin films

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Résumé en anglais Temperature dependences of electric conductivity and thermoelectric power of some recently synthesized organic compounds, 4-tert-butylcalix[4]arene derivatives, are studied. Thin-film samples ($d = 0.10\text{-}0.40 \mu\text{m}$) spin-coated from chloroform solutions onto glass substrates were used. Organic films with reproducible electron transport properties can be obtained if, after deposition, they are submitted to a heat treatment within temperature range of 295-575 K. The studied polycrystalline compounds show typical p-type semiconductor behavior. The activation energy of the electric conduction ranges between 0.82 and 1.12 eV, while the ratio of charge carrier mobilities was found in the range of 0.83-0.94. Some correlations between semiconducting parameters and molecular structure of the organic compounds have been discussed. In the higher temperature ranges ($T > 420 \text{ K}$), the electron transport in examined compounds can be interpreted in terms of the band gap representation model, while in the lower temperature range, the Mott's variable-range hopping conduction model was found to be appropriate. The investigated compounds hold promise for thermistor applications.

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